Allied Telesis™

WR4500 SERIES
IEEE 802.11 Dual Band Outdoor Wireless Routers

AT-WR4542
5GHz outdoor router/CPE with 22dBi embedded antenna

AT-WR4561
Dual band single radio outdoor wireless base router

AT-WR4562
Dual band dual radio outdoor wireless base router

A Complete Solution for Wireless ISPs, Local Utilities, Municipalities, Hospitality and Enterprises

The WR4500 family of dual band outdoor wireless base routers and routing CPEs allow the building of wireless only or hybrid IP networks that are scalable, reliable and fully controllable.

Wireless ISPs can easily and quickly provide homes in rural areas with broadband Internet access and VoIP telephony and, at the same time, can set-up WiFi hot spots for nomadic users.

Enterprises can connect remote buildings without the need for expensive leased lines and can extend WiFi coverage to outdoor yards providing users with mobile intranet and Internet access everywhere.

Municipalities can build wireless IP networks for connecting remote offices and for increasing public safety with real time monitored surveillance cameras and continuous communication with local police patrols. Local utilities can easily control their remote equipments and read, in real time, gas, water and electricity meters without any need for expensive fiber cabling.

Hot spot services can be provided to hotel guests and hospital patients 'illuminating' rooms from outside the building with a reduced impact on medical equipments because no transmit radio will be installed inside the hospital.

The single radio AT-WR4561 model can be used as either a base router, a hot spot or a wireless CPE while the dual radio AT-WR4562 can be deployed at the same time as both a wireless only base router and hot spot or base station in a Point to Multipoint configuration.

The AT-WR4542 with its embedded high gain antenna is best suited for being used as a wireless CPE connecting to an AT-WR4561 or AT-WR4562 base router or can be deployed in couples for realizing long reach high performances Point to Point links.

Flexibility is the primary advantage of the WR4500 family of wireless base routers. All products share the same software and features and differ only in the number of radio interfaces.

Real Wireless IP Routers

The WR4500 dual band wireless base routers have all the features of IP routers and much more. A full set of routing protocols together with enhanced filtering capabilities make the WR4500 series the best choice for building simple and complex wireless and hybrid (wired-wireless) networks with a tight integration between the wired and wireless parts.

IP routing allows network designers to design and deploy fully redundant networks with predictable behaviour in any working condition, while network operations managers retain full control over packet forwarding.

Point to Point, Point to Multipoint as well as partially or fully meshed networks can be easily

Key Features

- Feature rich firmware

- Real IP routing functionalities

- 2.4 GHz and 5 GHz dual band operations

- IEEE 802.11a/b/g/h compliant

- Certified for HiperLAN bands operation in Europe with DFS and TPC

- IEEE 802.3af compliant PoE powering

- IP66 rated outdoor robust construction

- Professional look suitable for indoor installation too

- Embedded IP firewalling functionalities

- Highly configurable QoS management for multimedia applications

- High sensitivity radio interface for longer reach and higher throughput on wireless links

- Wide choice of omnidirectional, directional and sector antennas

- RoHS compliant

designed and deployed with limited need for deciding in advance the network architecture. Common network management tools can be used for configuring and monitoring the network and its users the usual way. Any network engineer will be able, with little wireless training, to design and troubleshoot an Allied Telesis powered wireless network.

Wireless Networking Made Easy

Wireless specific functionalities are integrated in the WR4500 firmware in such a way that setting up a standard WiFi access point is as easy as configuring an interface. Integrated hot spot functionalities makes it equally easy setting up a public or private hot spot for public Internet access and or controlled access to intranets.

Specifications
Physical Specifications
AT-WR4542

Dimensions	34cm x 34cm x 5cm
(W x D x H)	13.4" x 13.4" x 2"
Weight	1.9 Kg (4.2 lbs)

Metal mounting kit and equipment back, plastic radome

AT-WR4561 and AT-WR4562

Dimensions	21.2cm x 5.7cm x 18.3cm
(W x D x H)	8.4" x 2.2" x 7.2"
Weight	1.2 Kg (2.7 lbs)

100% die cast aluminium enclosure

Environmental Specifications
Operating conditions

temperature:	-30°C to +65°C
	(-22°F to +140°F)
Relative humidity:	5% to 95% (non-condensing)

Storage conditions

temperature:	-40°C to +70°C
	(-40°F to +158°F)
Relative humidity:	5% to 95% (non-condensing)

Robustness
IEC 60529 protection Level: IP66 (AT-WR4561, AT-WR4562)
IP65 (AT-WR4542)
MTBF: 39,000 hrs

Power Characteristics
AT-WR4561 and AT-WR4562

Power:	PoE IEEE 802.3af compliant
Power consumption:	7W (AT-WR4561)
	10W (AT-WR4562)

AT-WR4542

Power:	18vDC PoE, 100-240V AC PS
Power consumption:	6W

Interfaces
Fast Ethernet interfaces

Standard:	IEEE 802.3u (MDI/MDI-X)
Ports:	1
Connector:	RJ-45 female

Radio interfaces
AT-WR4542

Radio:	1
Standard:	IEEE 802.11a/b/g/h
Connector:	n.a. (integrated antenna)

AT-WR4561

Radio:	1
Standard:	IEEE 802.11a/b/g/h
Connectors:	2 x N type female (diversity)

AT-WR4562

Radios:	2
Standard:	IEEE 802.11a/b/g/h
Connectors:	2 x N type female

Antenna Characteristics
(AT-WR4542 only)

Type:	Flat panel
Polarization:	Linear
Gain:	22 dBi
3dB beam width:	10.5°
Frequency range:	5.1 to 5.8 GHz

Layer 2 Features
Bridging
- IEEE 802.1D Spanning-Tree Protocol
- IEEE 802.1w Rapid Spanning-Tree Protocol
- Multiple bridge interfaces
- Bridge firewalling
- MAC NAT

VLAN
- IEEE 802.1Q VLAN tagging on Ethernet and wireless links
- Multiple VLANs
- VLAN bridging

Layer 3 Features
Routing
- Static routing
- Equal cost multi-path routing
- Policy-based routing
- RIPv1 / v2
- OSPFv2

Firewall and NAT
- Stateful packet filtering
- Peer-to-Peer protocol filtering
- Source and destination NAT
- Packet classification by:
  - Source MAC
  - Interfaces
  - IP addresses and subnets
  - Ports and port range
  - Protocols
  - Protocol options (ICMP type, TCP flags and MSS)
  - ToS (DSCP)
  - Packet content (matching sequence/frequency)
  - Packet size
  - Time

QoS management
- Hierarchical HTB QoS system with bursts
- Per IP / protocol / subnet / port / firewall mark
- PCQ, RED, SFQ, FIFO queue
- CIR, MIR, contention ratios, dynamic client rate equalizing (PCQ), bursts, peer-to-peer protocol limitation

Tunneling protocols
- PPTP, PPPoE and L2TP access concentrators and clients
- PAP, CHAP, MSCHAPv1 and MSCHAPv2 authentication protocols
- RADIUS authentication and accounting
- MPPE encryption; compression for PPPoE
- Data rate limitation
- Differentiated firewall
- PPPoE dial on demand
- IPIP tunnels, EoIP (Ethernet over IP)

IPSec
- IP security AH and ESP protocols
- MODP Diffie-Hellman groups 1,2,5
- MD5 and SHA1 hashing algorithms
- DES, 3DES, AES-128, AES-192, AES-256 encryption algorithms
- Perfect Forwarding Secrecy (PFS) MODP groups 1,2,5

Proxy
- FTP and HTTP caching proxy server
- HTTPS proxy
- Transparent DNS and HTTP proxying
- SOCKS protocol support
- DNS static entries
- Support for caching on a separate drive
- Access Control Lists
- Caching lists
- Parent proxy support

DHCP
- DHCP server per interface
- DHCP relay
- DHCP client
- Multiple DHCP networks
- Static and dynamic DHCP leases
- RADIUS support

VRRP
- VRRP protocol for high availability

UPnP
- Universal Plug & Play support

NTP
- Network Time Protocol server and client

Monitoring/accounting
- IP traffic accounting
- Firewall actions logging
- Statistics graphs accessible via HTTP GUI

Management
- SNMP read-only
- SSH and Telnet CLI
- Web GUI
- Windows-based GUI

Tools
- Ping
- Traceroute
- Bandwidth test
- Ping flood
- Packet sniffer
- Dynamic DNS update tool

Wireless Features
Operation modes
- Point to Point
- Point to Multipoint
- Integrated hot spot
- WDS: Wireless Distribution System
- Access point (infrastructure mode)
- Wireless client (station mode)
- Multiple SSID/BSSID and virtual AP
- AP bridging
- Nstreme and Nstreme2 protocols for dual radio full-duplex operation
- Dynamic Frequency Selection (DFS)
- Transmit Power Control (TPC)

Hot spot features
- Hot spot gateway with RADIUS authentication and accounting
- True Plug & Play access for network users
- Data rate limitation
- Traffic quota
- Differentiated firewall
- Real-time status information
- Walled-garden
- Customized HTML login pages
- iPass support
- SSL secure authentication
- Advertisement support

Access security
- 40 and 104-bit WEP
- WPA and WPA-PSK
- AES-CCM and TKIP encryption
- Access Control List
- Std FIPS 197 AES

Authentication
- RADIUS
- EAP and IEEE 802.1x

Technical Specifications
Standards and Protocols
IEEE

IEEE 802.1D	MAC bridges
IEEE 802.1Q	Virtual LANs
IEEE 802.1x	Port-based network access control
IEEE 802.1w	Rapid reconfiguration of Spanning-Tree
IEEE 802.2	Logical link control
IEEE 802.3-2002	CSMA/CD access method and physical layer specifications
IEEE 802.3af	DTE power via Media Dependent Interface (MDI)
IEEE 802.3u	100TX
IEEE 802.3x	Full-duplex operation
IEEE 802.11a	WLAN MAC and PHY specifications. High-speed physical Layer in the 5 GHz band
IEEE 802.11b	WLAN MAC and PHY specifications. Higher-speed physical layer extension in the 2.4 GHz band
IEEE 802.11g	WLAN MAC and PHY specifications. Amendment 4: further higher data rate extension in the 2.4 GHz band
IEEE 802.11h	WLAN MAC and PHY specifications. Amendment 5: spectrum and transmit power management extensions in the 5 GHz band in Europe
IEEE 802.11i	WLAN MAC and PHY specifications. Amendment 6: MAC security enhancements

IETF

RFC 768	UDP	
RFC 791	IP	
RFC 792	ICMP	
RFC 793	TCP	
RFC 826	ARP	
RFC 854	Telnet protocol specification	
RFC 855	Telnet option specifications	
RFC 856	Telnet binary transmission	
RFC 857	Telnet echo option	
RFC 858	Telnet suppress go ahead option	
RFC 932	Subnetwork addressing scheme	
RFC 950	Subnetting, ICMP	
RFC 951	BootP	
RFC 959	FTP	
RFC 1027	Proxy ARP	
RFC 1035	DNS	
RFC 1058	RIPv1	
RFC 1091	Telnet terminal-type option	
RFC 1122	Internet host requirements	
RFC 1155	MIB	
RFC 1157	SNMP	
RFC 1212	Concise MIB definitions	
RFC 1213	MIB-II	
RFC 1245	OSPF protocol analysis	
RFC 1246	Experience with the OSPF protocol	
RFC 1256	ICMP router discovery messages	
RFC 1305	NTP version 3	
RFC 1334	PPP authentication protocols	
RFC 1350	TFTP	
RFC 1493	Definitions of managed objects for bridges	
RFC 1518	An architecture for IP address allocation with CIDR	
RFC 1519	Classless Inter-Domain Routing (CIDR)	
RFC 1542	Clarifications and extensions for the BootStrap protocol	
RFC 1631	The IP Network Address Translator (NAT)	
RFC 1643	Ethernet MIB	
RFC 1661	The Point-to-Point Protocol (PPP)	
RFC 1701	GRE	
RFC 1702	GRE over IPv4	
RFC 1793	Extending OSPF to support demand circuits	
RFC 1812	Router requirements	
RFC 1829	IPSec algorithm	
RFC 1858	Fragmentation	
RFC 1877	PPP Internet protocol control protocol extensions for name server addresses	
RFC 1918	IP addressing	
RFC 1945	HTTP/1.0	
RFC 1994	PPP Challenge Handshake Authentication Protocol (CHAP)	
RFC 2003	IP encapsulation within IP	
RFC 2011	SNMPv2 Management Information Base for the Internet protocol using SMIv2	
RFC 2049	MIME	
RFC 2068	HTTP/1.1	
RFC 2082	RIP-2 MD5 authentication	
RFC 2096	IP forwarding table MIB	
RFC 2113	IP router alert option	
RFC 2131	DHCP	
RFC 2136	Dynamic updates in the Domain Name System (DNS UPDATE)	
RFC 2246	The TLS protocol version 1.0	
RFC 2284	EAP	
RFC 2328	OSPFv2	
RFC 2338	Virtual Router Redundancy Protocol	
RFC 2401	Security architecture for IP	
RFC 2402	IP authentication header	
RFC 2403	IPSec authentication - MD5	
RFC 2433	Microsoft PPP CHAP extensions	
RFC 2453	RIPv2	
RFC 2474	DCSP in the IPv4 and IPv6 headers	
RFC 2516	A method for transmitting PPP Over Ethernet (PPPoE)	
RFC 2616	Hypertext Transfer Protocol - HTTP/1.1	
RFC 2637	Point-to-Point Tunneling Protocol (PPTP)	
RFC 2661	L2TP	
RFC 2663	IP Network Address Translator (NAT) terminology and considerations	
RFC 2759	Microsoft PPP CHAP extensions, version 2	
RFC 2790	Host MIB	
RFC 2863	The interfaces group MIB	
RFC 2865	RADIUS	
RFC 2866	RADIUS accounting	
RFC 3007	Secure Domain Name System (DNS) dynamic update	
RFC 3022	Traditional NAT	
RFC 3046	DHCP relay agent information option	
RFC 3164	Syslog protocol	
RFC 3168	The addition of Explicit Congestion Notification (ECN) to IP	
RFC 3768	VRRP	
RFC 4251	The Secure Shell (SSH) protocol architecture	

Radio Characteristics

Frequency band:	2.4 GHz		5 GHz
Radio type:	IEEE 802.11b/g		IEEE 802.11a/h
Modulation:			
1Mbps	DBPSK (DSSS)		n.a.
2Mbps	DQPSK (DSSS)		n.a.
5.5 and 11Mbps	CCK (DSSS)		n.a.
6 and 9Mbps		PSK (OFDM)	
12 and 18Mbps		QPSK (OFDM)	
24 and 36Mbps		16-QAM (OFDM)	
48 and 54Mbps		64-QAM (OFDM)	
Channels:			
US/Canada (FCC)	11 overlapping (1 to 11)	12 non overlapping (5.150 to 5.350; 5.725 to 5.825)	
Europe (ETSI)	13 overlapping (1 to 13)	19 non overlapping (5.150 to 5.350; 5.470 to 5.725)	
France	4 overlapping (10 to 13)	19 non overlapping (5.150 to 5.350; 5.470 to 5.725)	
Japan (Telec)	13 overlapping (1 to 13)	4 non overlapping (5.150 to 5.250)	
China	13 overlapping (1 to 13)	5 non overlapping (5.725 to 5.850)	
Other countries		Per local regulations	

	Standard	Data Rate (Mbps)		Receive Sensitivity (dBm)	Max Output Power (*) (dBm)
		Normal Mode	Super AG Mode		
AT-WR4561 & AT-WR4562 — AT-WR4542	IEEE 802.11a/h	6	12	-88	17
		9	18	-87	17
		12	24	-85	16
		18	36	-83	16
		24	48	-80	15
		36	72	-75	15
		48	96	-73	14
		54	108	-71	13
	IEEE 802.11b	1	n.a.	-95	18
		2		-94	18
		5.5		-92	18
		11		-90	18
	IEEE 802.11g	6	12	-90	18
		9	18	-89	18
		12	24	-87	17
		18	36	-85	17
		24	48	-82	16
		36	72	-79	16
		48	96	-76	15
		54	108	-74	15

(*) This is the actual Radio Output Power and does not include the Antenna gain.

Regulatory Approvals

EMI/EMC: FCC part 15 Class B
             CE marking Class A
Safety: IEC60950, UL60950, CSA60950,
             EN60950

RoHS compliant

Ordering Information

AT-WR4542-xx
5GHz outdoor wireless router/CPE with 22dBi embedded antenna

Where xx =   10 for North America
               30 for UK
               40 for Australia
               50 for Europe

AT-WR4561-00
Dual band single radio outdoor wireless base router

AT-WR4562-00
Dual band dual radio outdoor wireless base router

Associated Products

AT-TQ00xx
Cables and accessories

AT-TQ02xx
2.4GHz antennas and accessories

AT-TQ05xx
5 GHz antennas and accessories

AT-6101
IEEE 802.3af PoE injector

Connecting The (IP) World

Allied Telesis